

02 MAR 2005

10/526419⁵²⁶ 419

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
11 March 2004 (11.03.2004)

PCT

(10) International Publication Number
WO 2004/020081 A2

(51) International Patent Classification⁷: **B01F 15/04**,
3/02, 5/04, G05D 11/02, 11/13, G01N 33/00

Arthur [GB/GB]; National Physical Laboratory, Queens
Road, Teddington, Middlesex TW11 0LW (GB).

(21) International Application Number:
PCT/GB2003/003779

(74) Agents: **JEHAN, Robert** et al.; Williams Powell, Morley
House, 26-30 Holborn Viaduct, London EC1A 2BP (GB).

(22) International Filing Date: 27 August 2003 (27.08.2003)

(81) Designated State (*national*): US.

(25) Filing Language: English

(26) Publication Language: English

(84) Designated States (*regional*): European patent (AT, BE,
BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

(30) Priority Data:
0220338.8 2 September 2002 (02.09.2002) GB

Published:

(71) Applicant (*for all designated States except US*): **THE
SECRETARY OF STATE FOR TRADE AND INDUS-
TRY** [GB/GB]; 1 Victoria Street, London SW1 0ET (GB).

— *without international search report and to be republished
upon receipt of that report*

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **GOODY, Brian**,

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: PRODUCTION OF VARIABLE CONCENTRATION FLUID MIXTURES

(57) **Abstract:** In a fluid mixing device calibration and complementary gases are supplied to constant flow devices (10,12). The flows through devices (10,12) are adjusted to be equal. The two gas flows are connected to switching valves (14,16), which allow the gas flows to be either vented or fed to the frequency multiplier (18). The two valves (14,16) are coupled to switch simultaneously but in opposite positions. Thus, the flow rate into the frequency multiplier (18) is constant but may be switched to comprise either calibration or complementary gas. The frequency multiplier divides the input stream into a number of equal streams which, after different time delays have been introduced, are recombined to produce a single stream of reduced concentration ripple and periodicity. The output from the frequency multiplier (18) fed to a series of chambers (20-24) where each chamber produces an attenuation of the concentration ripple and a time response to a change in concentration. As the attenuations of the chambers (20-24) are multiplicative and the time responses are additive, multiple chambers give a higher ratio of ripple attenuation to time response than does a single chamber. Better and faster production of substantially homogenised fluid mixtures is possible.



WO 2004/020081 A2